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09/243,689	02/03/1999	RICHARD M. WASSERMAN	101473	2795

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EXAMINER	
PECONE, RICHARD A	
ART UNIT	**PAPER NUMBER**
2123	

DATE MAILED: 01/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/243,689	WASSERMAN, RICHARD M.
	Examiner	Art Unit
	Richard A Pecone	2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)
2) ☑ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☑ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Introduction

1. Claims 1-42 of U. S. Application 09/243689 filed on 1-February, 1999, are presented for examination.

Claim Rejections - 35 USC § 112

2. Claim 1: A vision system hardware component simulation system for machine vision, comprising: a first model representing at least one object;
a second model representing an optical system; and
a processor that generates an image of a virtual world containing the at least one object based upon the first model and the second model.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The last two model limitations of claim 1 do not disclose what elements or parts are contained in the optical system, or virtual world to one who has ordinary skill in the art in light of the specification

3. Claim 8. The vision system hardware component simulation system of claim 1, wherein the first model comprises at least one of
a world model;
a static model;
a stage model; and
a component model.

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The first three model limitations of claim 8 do not disclose

what elements or parts are contained in the world, static, or component model to one who has ordinary skill in the art in light of the specification.

4. Claim 10. The vision system hardware component simulation system of claim 1, wherein the processor comprises:
a rendering engine; and
a lens effects engine.

Claim 11. The vision system hardware component simulation system of claim 1, wherein the processor comprises a rendering and lens effect engine.

Claims 10 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The terms "lens effect engine" and "rendering engine" cannot be determined in meaning to one who has ordinary skill in the art in light of the specification.

5. Claim 12. The vision system hardware component simulation system of claim 1, wherein the second model represents an optical system having an infinite depth of field.

Claim 28. The method of claim 22, wherein the second model characterizes an optical system with an infinite depth of field.

Claims 12 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "having an infinite depth of field" has no explanation of any limits in numerical range to properly interpret its meaning in light of the specification to one who has ordinary skill in the art.

6. Claim 42. The method of claim 41,furthercomprising:determining if any lens effects are to be applied to the rendered image; and if any lens effects are to be applied, applying the lens effects to the rendered image.

Claim 42 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "if any lens effects" has no explanation of any effect limits (eg., numerical range) to properly interpret its meaning in light of the specification to one who has ordinary skill in the art.

7. Claim 43. The method of claim 41, further comprising: determining if an external view is to be rendered based on the rendered scene;and if the external view is to be rendered, rendering the external view.

Claim 43 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim does not clarify this method as to if it is an automated programming instruction or an operator is performing this determination. To one who has ordinary skill in the art, its meaning cannot be interpreted in light of the specification.

Claim Interpretation

8. The claims will be interpreted as discussed for purposes of a prior art rejection.

. Each model in claim 1 (virtual world, and optical system) will be interpreted to be programmed model files of a CAD model system (ie., DWG files, etc.)

which will contain indefinate elements of the models: optical system, and virtual world. These elements could be the lens or the camera system for the optical system, and the entire workpiece/vision system setup for the virtual world.

Each model in claim 8 (world, static, stage, and component) will be interpreted to programmed model files of a CAD model system (ie., DWG files, etc.) which will contain indefinite elements of the models. These elements could be the lens or the camera system, or the entire workpiece/vision system setup for the world model.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claim 1 rejected under 35 U.S.C. 103(a) as being unpatentable over Buckley, et al (6,064,759);

> A vision system hardware component simulation system for machine vision, comprising: a first model representing at least one object;

Buckley discloses measuring the dimensions of an object in a simulation (Computer Aided Inspection) process as what was taught in claim 1 (See Column 5/lines 30 – 35).

> a second model representing an optical system; and a processor that generates an image of a virtual world containing the at least one object based upon the first model

and the second model.

Buckley discloses error data that contains: the vision system's camera/lighting system, and moving support structure/plate which is equivalent to the intent of the optical system model (See Column 7/lines 5 – 67). This data is applied to the geometric model's dimensions in the computer to calculate where the correct 3D points are located to measure subsequent part types (See Column 14/lines 24-29). This camera/lighting data represents data that is being imputed into the simulated geometric object model to correct for locations of geometric features. This data input is performing the same function to the geometric model which is correcting for light effects on a simulated model prior to performing the on-line part inspection process. It is obvious to one who has ordinary skill in the art at the time of the invention, that this error correcting data could be programmed in as different models or CAD files (optical system, or virtual world model) as above in claim 1.

11. Claim 2 is rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> The vision system hardware component simulation system of claim 1, wherein:
> at least one of the first and second models includes information which characterizes the relative orientation and position of the corresponding at least one object and the optical system; the image of the virtual world comprising an image of the at least one object as seen through the optical system

This is disclosed in Column 7/lines 5 thru 67, and Column 8/lines 5 – 15 of Buckley. The geometric model or the CAD model is modified as a base model into different model appearances/dimension modifications based on optical system error.

This final CAD model is a simulated model that is adjusted for optical system error as in claim 2 prior to inspecting subsequent models. In addition, the object is characterized with x, y, and z coordinates that are relative to a reference frame. It is obvious to one who has ordinary skill in the art the time of the invention, that this error correcting data could be programmed in as different models or CAD files (optical system, or virtual world model) as above in claim 2.

12. Claims 3 and 4 are rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> Claim 3. The vision system hardware component simulation system of claim 1, further comprising at least one additional model representing at least one of a stage, a workpiece fixture and a lighting system, wherein the processor further generates the image of the virtual world based on the at least one additional model.
>
> Claim 4. The vision system hardware component simulation system of claim 3, wherein the at least one additional model further represents a stage table.

This is disclosed as programming in Column 7/lines 5 thru 67, and Column 8/lines 5 – 15 of Buckley: velocity of moving plate or stage table, light source and camera (camera frame rate) which is the lighting system, origin frame, and a moving reference frame relative to a plate/stage. This data input is performing the same function to the geometric model which is correcting for light effects and the workpiece fixture on a simulated model prior to performing the on-line part inspection process. It is obvious to one who has oridinary skill in the art at the time of the invention, that this error correcting data could be programmed in as different models or CAD files (virtual world model) as above in claims 3 and 4.

13. Claim 5 is rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> The vision system hardware component simulation system of claim 3, wherein the at least one additional model is a lighting system model that represents at least one of a magnitude, a color, a type and an orientation of at least one lighting source.

This is disclosed as programming in Column 7/lines 5 thru 67, and Column 8/lines 5 – 15 of Buckley, ie., light source and camera (camera frame rate) which is a lighting system. This lighting system (ie, angle and coordinates) has a reference frame that is to a C,R,F data point system (Column 7/lines 35 – 37). This data input is performing the same function to the geometric model which is correcting for lighting effects on a simulated model prior to performing the on-line part inspection process. It is obvious to one who has ordinary skill in the art at the time of the invention, that this error correcting data could be programmed in as different models or CAD files (lighting system model) as above in claim 5..

14. Claim 6 is rejected under 35 U.S.C. 103(a); as being unpatentable over Buckely, et al (6,064,759);

> The vision system hardware component simulation system of claim 3, wherein the first model comprises a representation of at least one of a position and an orientation of the at least one object relative to the stage.

This is disclosed as programming in Column 7/lines 5 thru 67, and Column 8/lines 5 – 15 of Buckley, ie., the object or part being measured relative to a plate/stage or a moving reference frame. (See Column 7/lines 5 – 67). This data input is performing

the same function to the geometric model which is correcting for the object being fixed to a moving stage on a simulated model prior to performing the on-line part inspection process. It is obvious to one who has ordinary skill in the art at the time of the invention, that this error correcting data could be programmed in as different models or CAD files (first model) as above in claim 6..

15. Claims 7, 8, and 9 are rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> Claim 7. The vision system hardware component simulation system of claim 1, wherein the second model comprises: a lens system model; and a lighting model
>
> Claim 8. The vision system hardware component simulation system of claim 1, wherein the first model comprises at least one of a world model; a static model; a stage model; and a component model.
>
> Claim 9. The vision system hardware component simulation system of claim 8, wherein the world model is at least partially constructed from at least one of the static model, the stage model and the component model.

Buckley discloses an error equation relationship that inputs error data which contains the variables of: camera frame rate, moving plate, reference frame, lighting angle and coordinates which is applied to a geometric model simulated in a computer (See Column 7/lines 5 – 67). This data is applied to the geometric model's dimensions in the computer to calculate where the correct 3D points are located to measure subsequent part types (See Column 14/lines 24-29). The geometric model can be optimized or changed into different sets of dimensional inspection points which produces modified programmed geometric model files. It is obvious to one who has ordinary skill in the art at the time of the invention, that the different programmed files

based on different error inputs could be programmed in as different models or CAD files (world model, static model, stage model, component model, lens system model, lighting model, etc.) as above in claims 7, 8, and 9.

16. Claims 13, 14, and 15 are rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> Claim 13. The vision system hardware component simulation system of claim 1, further comprising a control instruction generation system.
>
> Claim 14. The vision system hardware component simulation system of claim 13, wherein the control instruction generation system comprises an inspection program generation system.
>
> Claim 15. The vision system hardware component simulation system of claim 13, wherein the control instruction generation system comprises a motion command generation system.

Buckley discloses how the software and inspection instruction software for a part type program is generated. The final inspection software instructions are based on the error between the error data affects from the vision system (ie., camera, moving table, light angle, etc.) and the geometric object model to calculate the 3-space point data. This is equivalent to claims 13, 14, and 15 in producing the final inspection part program. (See Column 14, lines 24-29)

17. Claims 16 and 17 are rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> Claim 16. The vision system hardware component simulation system of claim 1,

wherein the second model characterizes an image capture system and a lens system.

Claim 17. The vision system hardware component simulation system of claim 16, wherein the second model characterizes at least one of an aperture, a focal length, an image magnification, and an optical system geometry of the lens system.

Buckley discloses a Computer Aided Inspection program that performs inspection simulation taking into account a camera/lighting system (eg., lighting coordinates, lighting angle, frames/sec, etc.). These parameters are a result of the aperture, focal length, and image magnification on a camera and are equivalent to claims 16 and 17.

18. Claim 18 is rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

The vision system hardware component simulation system of claim 16, wherein the second model characterizes at least one of an imaging system pixel size and an imaging system pixel spacing of an image capture system.

Buckley discloses a technique called Spatial Averaging to increase the accuracy of the camera's lighting/data collection method which uses pixel spacing as a system of measure as in claim 18. (See Column 8/lines 30-35).

19. Claims 19, 20, and 21 are rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

Claim 19. The vision system hardware component simulation system of claim 1, further comprising a user interface that presents the image.

Claim 20. The vision system hardware component simulation system of claim 1, further comprising a user interface includes means for modifying at least one of the first and second models.

Claim 21.The vision system hardware component simulation system of claim 1, further comprising a user interface for a machine vision inspection system to simulate, the user interface simulating at least one operation of the machine vision inspection system independent of at least one component of the machine vision inspection system.

A user interface is inherent in Buckley's Computer Aided Vision System to input the geometric model and error data as in claims 19, 20, and 21. As in claim 21, Buckley teaches about an operator scanning in a part to create a graphical simulated image (geometric model) to generate vision system set-up instructions. These are user inspection control instructions to generate an inspection program, ie., set-up, etc. (Column 4/lines 2 – 20)

The dimensions on the geometric model can be changed by the appropriate error data (user – operator, etc.) to modify/optimize the geometric model for on-line inspection as in claim 20.

20. Claims 22, 23, and 24 are rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

Claim 22 A method for simulating images based on the characteristics of at least one machine vision hardware component, comprising:
generating a simulated image of a virtual world containing at least one object based upon a first model that characterizes the at least one object and a second model that characterizes an optical system; and

Claim 23 The method of claim 22, wherein generating the simulated image based on the first and second models comprises:
processing position data characterizing a relative position and orientation of the at least one object and the optical system;
processing component data; and processing optical system parameters.
Claim 24. The method of claim 23, wherein generating the simulated image based on the first and second models further comprises processing lighting system parameters, the lighting system parameters including at least one of a position and an orientation relative to the at least one object, a magnitude, a color and a type of at least one lighting source.

Buckley discloses an error equation relationship that inputs error data which contains the variables of: optical system - camera frame rate, moving plate, reference frame as in claims 22 and 23; and a lighting system - lighting source/angle with color and coordinates relative to the object as in claim 24 which is applied to a geometric model simulated in a computer (See Column 7/lines 5 – 67). This data is applied to the geometric model's dimensions in the computer to generate where the correct 3D points are located to measure subsequent part types (See Column 14/lines 24-29). The geometric model can be optimized or changed into different sets of dimensional inspection points which produces modified programmed geometric model files. It is obvious to one who has ordinary skill in the art at the time of the invention, that the different programmed files based on different error inputs could be programmed in as different models or CAD files (virtual model, etc.) as above in claims 22, 23, and 24.

21. Claims 25, 26, and 27 are rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> Claim 25. The method of claim 22, wherein: the first model comprises at least one of a component model, a stage model and a static model; and generating the simulated image further comprises generating the simulated image based on at least one of the component model, the stage model and the static model.
>
> Claim 26. The method of claim 25, wherein the stage model represents at least one of a stage table and a movable stage component.
>
> Claim 27. The method of claim 26, wherein the component model includes a representation of at least one of a position and an orientation of the at least one object on the movable stage component.

Buckley takes into account the movable stage components of claim 25, 26, and 27 by disclosing an error equation relationship that inputs error data which contains the dynamic variables of: camera frame rate, moving plate, and reference frame with, lighting angle and coordinates which is applied to a geometric model simulated in a computer (See Column 7/lines 5 – 67). This data is applied to the geometric model's dimensions in the computer to calculate where the correct 3D points are located to measure subsequent part types (See Column 14/lines 24-29). The geometric model can be optimized or changed into different sets of dimensional inspection points which produces modified programmed geometric model files. It is obvious to one who has ordinary skill in the art at the time of the invention, that the different programmed files based on different error inputs could be programmed in as different models or CAD files (stage model, component model, static model, etc.) as above in claims 25, 26, and 27.

22. Claims 29, 30, 31, and 32 are rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> Claim 29. The method of claim 22, further comprising generating at least one inspection program instruction based on the simulated image.
>
> Claim 30. The method of claim 22, wherein the at least one inspection program instruction is based upon a user input.
>
> Claim 31. The method of claim 22, furthercomprising generating at least one control instruction based on the simulated image.
>
> Claim 32. The method of claim 31, wherein generating the at least one control instruction based on the simulated image comprises generating an inspection program

As in claims 29, 30, 31, and 32, Buckley teaches about an operator scanning in a part to create a graphical simulated image (geometric model) to generate vision system

set-up instructions. These are user inspection control instructions to generate an inspection program, ie., set-up, etc. (Column 4/lines 2 – 20)

23. Claim 33 is rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> The method of claim 31, wherein generating the at least one control instruction based on the simulated image comprises generating a motion command.

Buckley discloses how the software and inspection instruction software for a part type program is generated. The final inspection software instructions are based on the error between the error data affects from the vision system: eg., camera frame rate and moving table relative to the geometric object model to calculate the 3-space point data. As in claim 33, the control instruction will be interpreted as inspection control instruction which is based on the motion of components of the vision system which is taken into account by Buckley's error equation (eg., V, f, etc.). (See Column 7/lines 19 – 34 and Column 14, lines 24-29)

24. Claims 34, 35, and 36 are rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> Claim 34. The method of claim 22,further comprising:
> altering at least one of the first and second models based on at least one
> user input; and modifying the simulated image based on the altered one of the first and second models.
>
> Claim 35 The method of claim 34,furthercomprising repeating the altering and modifying steps.
> Claim 36. The method of claim 35, wherein the repeating continues until the simulated image represents a machine vision system state desired by the user.

Buckley discloses error data that contains the vision system's equipment affect during on-line part inspection. This is accomplished through applying this data to a simulated geometric model prior to on-line inspection of the part through programmed inspection instructions.(See Column 7/lines 5 – 67). This data is applied/inputted to the geometric model's dimensions in the computer to calculate where the correct 3D points are located to measure subsequent part types. This error data is inputted until the geometric model is optimized for inspection as in claim 36. (See Column 14/lines 24-29). It is obvious to one who has ordinary skill in the art at the time of the invention, that this error correcting data could be programmed in as different models or CAD files (first/second model) as above in claims 34, 35, and 36.

25. Claim 37 is rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> Claim 37. A method for facilitating the generation of at least one machine control instruction for a machine having a machine vision system independently of at least one element of the machine vision system, the method comprising:
> rendering a synthetic image of at least one object as viewed through the machine vision system based on a representation of at least one component of the machine vision system; and selecting a machine control instruction based at least in part on the synthetic image.

Buckley's CAD system has programmed instructions to generate or render the surfaces of the geometric model which represent points for inspection purposes for on-line vision system inspection. The model's 3D inspection points are modified using Spatial Averaging from the error correction data input (eg., camera frame rate, etc.). This is equivalent to claim 37 because the surfaces of the model are represented/simulated by CAD and are optimized or changed due to correction data or programmed instructions

that represents the vision system's equipment or components. (Column 29/lines 20 – 30, Figure 12a).

26. Claim 38 is rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> The method of claim 37, wherein rendering the synthetic image comprises updating in real-time a view of the at least one object through the simulation of the machine vision system in response to the user altering the representation of the at least one component of the machine vision system.

Buckley teaches about using Spatial Averaging from the error correction data input (eg., camera frame rate, etc.) to modify or optimize the geometric model. (Column 8/lines 30 – 35 and Figure 12a.).

27. Claim 39 is rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> The method of claim 37, wherein rendering the synthetic image is based on a depth of focus represented in the representation of the at least one component of the machine vision system.

Buckley's CAD system has programmed instructions to generate or render the surfaces of the geometric model which represent points for inspection purposes as modified using error correction data that represents the vision system's components. This error correction data input contains light reference coordinates and angle which through Spatial Averaging locate and calculate correct dimensions of features using the vision system. This accomplishes the same result as the depth of focus in claim 39

which focuses in on dimensional locations of the object's features. (Column 8/lines 30 – 35 and Figure 12a)

28. Claim 40 is rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759);

> The method of claim 37, further comprising: presenting the synthetic image to a user; and receiving a user input, wherein selecting the machine control instruction is in response to the user input.

As in claim 40, Buckley teaches about an operator or user scanning in a part to create a CAD simulated image (geometric model) to generate vision system set-up instructions. These are user inspection control instructions to generate an inspection program, ie., set-up, etc. (Column 4/lines 2 – 20)

29. Claim 41 is rejected under 35 U.S.C. 103(a); as being unpatentable over Buckley, et al (6,064,759) in view of Prior (6,301,763 B1);

> A method for generating a synthetic image independently of at least one element of a machine vision system, the synthetic image simulating an image from the machine vision system, the method comprising:
> initializing a scene of the synthetic image of at least one object as viewed through the machine vision system;
> adding a workpiece model of at least one workpiece to the scene, the at least one workpiece positioned on a stage of the scene;
> obtaining at least one of a position and an orientation of the stage relative to an optical system of the machine vision system; and
> rendering the scene based on at least one of the characteristics of the optical system and the obtained relative position and orientation of the optical system to generate the synthetic image.

Buckley's CAD system has programmed instructions to generate or render the surfaces of the geometric model or workpiece which represent points for inspection purposes for on-line vision system inspection. The simulated model's surfaces (3D

inspection points) are modified using Spatial Averaging from the error correction data input (eg, light angle and reference frame, camera frame rate, moving plate, etc.). The surfaces of the model are represented/simulated by CAD and are optimized or changed due to correction data or programmed instructions that represents the vision system's equipment or components. (Column 29/lines 20 – 30, Figure 12a).

Also, Pryor teaches about simulating or designing in other operations for target accuracy of a CAD simulated fabrication and assembly process which would be speed and camera lighting on the target object prior to on-line productions (Column 8/lines 1 – 3)

It is obvious to one who has ordinary skill in the art the time of the invention: 1) that the error correcting data could be programmed in as different models or CAD files (optical model, etc.) as in claim 41, and 2) detailed vision system equipment parameters (lens focal length, etc.) could be programmed into Pryor's assembly and fabrication model as in claim 41.

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. ***.

U.S. Pat. 6, 167,607 B1 to Pryor

Pryor teaches about imaging a fabrication and assembly process, which is not specific to vision system variables/effects although they are implied that they could be programmed into the computer system.

U.S. Pat. No. 6,289,299 B1 to Daniel

Daniel teaches about the virtual imaging of data, which is not specific to vision system variables/effects although they are implied that they could be programmed into the computer system.

U.S. Pat. No. 6,301,763 B1 to Myers

Myers teaches about the virtual imaging of "realworld" data, which is not specific to vision system variables/effects although they are implied that they could be programmed into the computer system.

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rich Pecone whose telephone number is (703) 305-3188. The examiner can normally be reached on Monday thru Friday from 8:15 AM to 4:45PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on (703) 305-9704. The fax number for the organization where the application or proceeding is assigned is (703) 308-1396.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed ot the receptionist whose telephone number is (703) 305-3900.

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER